

**Remarks**

**I. Status of claims**

Claims 1-21 are pending.

**II. Claim rejections under 35 U.S.C. § 112**

The Examiner has rejected claims 1, 2, 4, 6, 7, 13, 14, 17, 18, 20, and 21 under 35 U.S.C. § 112, second paragraph, "as being indefinite."

The claims have been amended in ways that address the Examiner's § 112, second paragraph, concerns.

The rejections under 35 U.S.C. § 112, second paragraph, now should be withdrawn.

**III. Claim rejections under 35 U.S.C. § 102**

The Examiner has rejected claims 3 and 5 under 35 U.S.C. § 102(b) over Goldenberg ("Automatic layout of variable-content print data").

Independent claim 3 has been amended and now recites:

Claim 3 (currently amended): A computer-implemented method of producing a layout of objects on a page, comprising:

generating a tree structure having at least one node and at least one leaf, where each leaf corresponds to one of the objects;

associating a respective bounding box with each node in the tree structure, wherein each bounding box includes all objects in any subtree below the associated node, each object has a respective fixed aspect ratio and is associated with a respective relative area proportion that has a value such that a ratio of the respective relative area proportion to a respective amount of area on the page that is occupied by the object in the layout is equal to an identical constant value for all the objects, and the associating comprises

establishing a respective relative area proportion  
and a respective aspect ratio for each node  
as a function of the relative area proportions

and the aspect ratios of all children of the node, and

prior to the establishing, adjusting relative area proportions of at least one child of each node and all children thereof so that predetermined dimensions of the children are equal;

assigning regions of the page for each node in the tree structure in accordance with the bounding box associated with the node; and

producing a layout of the objects on the page in accordance with the assignment of regions to the nodes.

In support of the rejection of claim 3, the Examiner has stated that (see page 4, bottom of first ¶ of the final Office action; emphasis added):

... Goldenberg further teaches adjusting relative area proportions of at least one child of each node and all children thereof so that predetermined dimensions of the children are equal, performed prior to said establishing (section 6.2.3 "Allowing relaxation of the aspect ratio constraints") (Goldenberg teaches at section 6.2.3 that the aspect ratio of layout can be adjusted. Goldenberg teaches at section 7.1 the capability of matching widths and heights of objects).

Contrary to the Examiner's statement, however, Goldenberg does not disclose "adjusting relative area proportions of at least one child of each node and all children thereof so that predetermined dimensions of the children are equal," where each respective relative area proportion "has a value such that a ratio of the respective relative area proportion to a respective amount of area on the page that is occupied by the object in the layout is equal to an identical constant value for all the objects," as now recited in claim 3. Instead, in accordance with Goldenberg's approach, the areas of the modules are fixed (see, e.g., page 11, § 3.2.1: "For each module, the area (A), upper and lower bounds for aspect ratio (r and s), and connection strength to each other module (which represents the wiring density between pairs of modules) are pre-specified.").

In § 6.2.3, Goldenberg discloses a modification to the cost evaluation function that includes a weighted penalty term that allows the user to control the aspect ratio of the layout as a whole. This section, however, does not disclose anything about “adjusting relative area proportions of at least one child of each node and all children thereof so that predetermined dimensions of the children are equal,” as recited in claim 3. Indeed, the aspect ratio of the layout does not constitute a “respective relative area proportion that has a value such that a ratio of the respective relative area proportion to a respective amount of area on the page that is occupied by the object in the layout is equal to an identical constant value for all the objects,” as now recited in claim 3.

In § 7.1, Goldenberg discloses that more attractive layouts can be generated if the type of objects that are to be laid out meet the criteria described in the bulleted list on page 36. This section, however, does not disclose anything about “adjusting relative area proportions of at least one child of each node and all children thereof so that predetermined dimensions of the children are equal,” as now recited in claim 3.

For at least these reasons, the rejection of claim 3 under 35 U.S.C. § 102(b) over Goldenberg should be withdrawn.

Claim 5 incorporates the elements of independent claim 3 and therefore is patentable over Goldenberg for at least the same reasons explained above in connection with independent claim 3.

#### IV. Claim rejections under 35 U.S.C. § 103

The Examiner has rejected claims 1, 2, 4, and 6-21 under 35 U.S.C. § 103(a) over Goldenberg (“Automatic layout of variable-content print data”) in view of Geigel (U.S. 2002/0122067).

##### A. Independent claim 1

Claim 1 has been amended and now recites:

1. A computer-implemented method of producing a layout of objects on a page, comprising:

generating different tree structures each having at least one node and at least one leaf, wherein each node corresponds to a respective partition of the page and each leaf defines a relative location of a respective one of the objects on the page, wherein each object has a respective fixed aspect ratio and is associated with a respective relative area proportion that has a value such that a ratio of the respective relative area proportion to a respective amount of area on the page that is occupied by the object in the layout is equal to an identical constant value for all the objects;

for each of the tree structures, characterizing a respective bounding box for each respective node in the tree structure based on the respective aspect ratios and the respective relative area proportions associated with all of the objects in all subtrees below the respective node, wherein each bounding box includes all of the objects in all subtrees below the respective node;

for each of the tree structures, assigning regions within the page for each node in the tree structure in accordance with the respective bounding box associated with the node;

for each of the tree structures, determining a respective score that comprises a measure of available space on the page that is unoccupied by the objects arranged on the page in accordance with partitions of the page defined by the tree structure;

selecting one of the tree structures based on the determined scores; and

producing a layout of the objects on the page based on the selected tree structure.

The rejection of claim 1 under 35 U.S.C. § 103(a) over Goldenberg in view of Geigel should be withdrawn because the cited references, taken either alone or in any permissible combination, do not disclose or suggest "for each of the tree structures, characterizing a respective bounding box for each respective node in the tree structure based on the respective aspect ratios and the respective relative area proportions associated with all of the objects in all subtrees below the respective node" where the respective relative area proportion associated with each object "has a value such that a ratio of the respective relative area proportion to a respective amount of area on the page that is occupied by the object in the layout is equal to an identical constant value for all the objects," as now recited in claim 1. Indeed, neither Goldenberg nor Geigel discloses or suggests anything about relative area proportion values as defined in claim 1.

For at least these reasons, the rejection of claim 1 under 35 U.S.C. § 103(a) over Goldenberg in view of Geigel now should be withdrawn.

**B. Dependent claims 2, 4, 6, and 7**

Each of claims 2, 4, 6, and 7 incorporates the elements of independent claim 1 and therefore is patentable over Goldenberg in view of Geigel for at least the same reasons explained above.

**C. Independent claim 8**

Independent claim 8 has been amended and now recites:

8. A method of producing a layout of fixed aspect ratio objects on a page, comprising:
- generating a binary tree structure comprising
    - a plurality of leaves, wherein each of the leaves corresponds to a respective one of the objects, and
    - a plurality of nodes including a root node, wherein each of the nodes corresponds to a respective partition of the page;
  - for each of the nodes in the binary tree structure, determining a respective aspect ratio and a respective area of a respective bounding box containing all bounding boxes respectively determined for all nodes and leaves branching from the node; and
  - producing a layout of the objects on the page based on the bounding box determined for the root node.

In the rejection of claim 8, the Examiner has acknowledged that Goldenberg does not disclose or suggest “for each of the nodes in the binary tree structure, determining a respective aspect ratio and a respective area of a respective bounding box containing all bounding boxes respectively determined for all nodes and leaves branching from the node,” as recited in claim 8. Instead, in the situation where the aspect ratios of the modules are fixed, all of the dimensions of the modules are predetermined because each module has a fixed area (see page 11, § 3.2.1,

second paragraph). In this situation, Goldenberg only discloses that the sizes of the containing rectangles into which the modules respectively fit are determined (see page 12, § 3.2.2.1); Goldenberg does not even hint that containing rectangles are determined for the intermediate nodes of the slicing trees.

In an effort to make-up for the failure of Goldenberg to disclose or suggest the “determining” element of claim 8, the Examiner has taken the following position (see page 7, lines 9-14, of the final Office action):

... This feature is taught by Geigel. Geigel teaches a system for automatic layout of images similar to that of Goldenberg ([0009]). Geigel further teaches for each of the nodes in the binary tree structure determining a respective aspect ratio and a respective area of a respective bounding box containing all bounding boxes respectively determined for all nodes and leaves branching from the node ([0117]-[0124], [0149])...

Contrary to the Examiner's position, however, ¶¶ 117-124 and 149 of Geigel do not disclose or suggest “for each of the nodes in the binary tree structure, determining a respective aspect ratio and a respective area of a respective bounding box containing all bounding boxes respectively determined for all nodes and leaves branching from the node,” as recited in claim 8.

In ¶¶ 117-118, Geigel discloses the effects of various criteria on the operation of the page creator module, which assigns images in a collection to album pages based on a first genetic evolution algorithm (see abstract and ¶ 88). Nowhere in either ¶ 117 or ¶ 118 does Geigel even hint that the operation of the page creator module involves “for each of the nodes in the binary tree structure, determining a respective aspect ratio and a respective area of a respective bounding box containing all bounding boxes respectively determined for all nodes and leaves branching from the node.”

In ¶¶ 119-124, Geigel discloses the operation of the page image placement module, which uses a second genetic evolution algorithm to generate genetic structures of page layouts for images that are assigned to a given page (see abstract and ¶ 119). Nowhere in either ¶¶ 119-124 does Geigel even hint that the operation of the image placement module involves “for each of the nodes in the binary tree structure, determining a respective aspect ratio and a respective area of a respective bounding box containing all bounding boxes respectively determined for all

nodes and leaves branching from the node.” Instead, Geigel discloses that the image placement module determines the absolute positions of the images on each of the album pages by evolving a genome that defines a respective layout of all of the images that have been assigned to the page by the page creator module (see ¶ 126: “The complete genome is comprised of the image positions of all images to be placed.”). For each of the album pages, the genome that has the highest fitness score is selected as the image layout for that album page (see ¶¶ 145, 153, 155, and FIGS. 23-26). In the process of evolving the floating point array genome, each image is placed individually on the page, without regard to respective aspect ratios and areas of any bounding box of a node that contains all bounding boxes respectively determined for all nodes and leaves branching from the node.

For at least these reasons, the rejection of claim 8 under 35 U.S.C. § 103(a) over Goldenberg in view of Geigel should be withdrawn.

D. Dependent claims 9-14

Each of claims 9-14 incorporates the elements of independent claim 8 and therefore is patentable over Goldenberg in view of Geigel for at least the same reasons explained above.

Claims 9-12 also are patentable over Goldenberg in view of Geigel for the same reasons explained above in connection with independent claim 3.

E. Independent claim 15

Independent claim 15 recites elements that essentially track the pertinent elements of claim 8 discussed above. Therefore, claim 15 is patentable over Goldenberg in view of Geigel for at least the same reasons explained above in connection with claim 8.

F. Dependent claims 16-21

Each of claims 16-21 incorporates the elements of independent claim 15 and therefore is patentable over Goldenberg in view of Geigel for at least the same reasons explained above.

Claims 16-19 also are patentable over Goldenberg for the same reason explained above in connection with claim 3.

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III. Conclusion

For the reasons explained above, all of the pending claims are now in condition for allowance and should be allowed.

Charge any excess fees or apply any credits to Deposit Account No. 08-2025.

Respectfully submitted,

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